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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/874,420	06/05/2001	Michael Arnold Joffe	US010279	5691

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EXAMINER	
YAM, STEPHEN K	

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 07/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/874,420	Applicant(s) JOFFE, MICHAEL ARNOLD
	Examiner Stephen Yam	Art Unit 2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *29 April 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-11 and 13-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-8,10,11 and 13-16* is/are rejected.

7)☒ Claim(s) *9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This action is in response to Amendments and remarks filed on April 29, 2003. Claims 1, 2, 4-11, and 13-16 are currently pending.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4, 5, 7, 10, 13, and 14 are rejected under 35 U.S.C. 102(b) as being unpatentable by Torii et al. US Patent No. 5,151,608.

Regarding Claim 1, Torii et al. teach (see Fig. 1) a positioning system comprising a workpiece (100), a light source (1) for directing a light beam onto the top surface of the workpiece, and a detector (3) coupled to said light source for detecting the light beam received by said workpiece and for processing (10) a deviation direction and a deviation amount based on a positional relationship (see Col. 6, lines 20-35) between an image of said light beam shifted (see Col. 7, lines 48-54) on the surface of said workpiece and a predetermined reference image.

Regarding Claim 4, Torii et al. teach the detector located above a normal axis associated with said workpiece (see Fig. 1).

Regarding Claim 5, Torii et al. teach the light source comprising a laser diode (see Col. 4, lines 31-34).

Regarding Claim 7, Torii et al. teach (see Fig. 1) a method for adjusting the vertical position of a workpiece (100), comprising transmitting (1) a light beam onto the top surface of said workpiece at a predetermined angle (from (2)) relative to a normal axis associated with said workpiece, detecting (3) the light beam projected on the top surface of said workpiece, detecting (16, 30) (see Fig. 2) a lateral shift (see Col. 7, lines 41-54) of said detected light beam on the top surface of said workpiece, and converting (30) (see Fig. 2) said detected lateral shift into a corresponding vertical distance (see Col. 7, lines 48-56) using trigonometry.

Regarding Claim 10, Torii et al. teach (see Fig. 1) a positioning system for a workpiece (100) comprising a light generating means (1) for projecting a light beam onto the top surface of the workpiece at a predetermined angle (from (2)), a video capturing means (3) for detecting the light beam received by said workpiece and for converting said detected light beam into electrical signals (see Col. 5, lines 53-59), and a computer means (10) for processing a deviation direction and a deviation amount based on said detected light beam shifted (see Col. 7, lines 48-54) on the surface of said workpiece and a predetermined reference image (see Col. 6, lines 20-35 and explanation below in Section 8).

Regarding Claim 13, Torii et al. teach the computer means determining a lateral shift direction and an amount of lateral displacement of said projected light beam within the surface of said workpiece (see Col. 7, lines 41-54).

Regarding Claim 14, Torii et al. teach the light generating means comprising a laser diode (see Col. 4, lines 31-34).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 2, 6, 8, 11, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Torii et al.

Regarding Claims 2 and 8, Torii et al. teach the system and method as taught in Claims 1 and 7, according to the appropriate paragraph above. Torii et al. also teach controlling the position of a welding robot (on which the distance sensor is attached) (see Col. 5, lines 29-34). Torii et al. do not teach a holding means for releasably holding said workpiece and vertically positioning the workpiece based on said deviation direction and amount. It is well known in the art that a holding means is used to releasably hold a workpiece for laser welding, that the vertical distance between the workpiece and the welding laser is varied (from the use of the distance sensor for the welding laser), and that moving the welding laser is equal to moving the workpiece, as the welding process functions equivalently regardless of which component is moved relative to the other. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a holding means for releasably holding the workpiece and vertically position the workpiece in the system and method of Torii et al., to precisely operate a welding laser in a laser welding system in a production line environment.

Regarding Claim 11, Torii et al. teach the system as taught in Claim 10, according to the appropriate paragraph above. Torii et al. do not teach a means for holding the workpiece in a substantially horizontal position and for moving said workpiece horizontally in an X-Y plane to a

preselected position. It is well known in the art that a laser welding system in a production line contains a holding means for securing and moving workpieces to be welded. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a means for holding the workpiece in a horizontal position and move the workpiece horizontally in an X-Y plane to a preselected position, to align the workpiece to the laser welding system to perform accurate welding.

Regarding Claims 6 and 15, Torii et al. teach the system as taught in Claims 1 and 10, according to the appropriate paragraph above. Torii et al. also teach the detector/video capturing means as a camera (see Col. 6, lines 56-66). Torii et al. do not teach the detector/video capturing means as a photodiode. It is well known in the art to use a photodiode as a light detector, as such devices are commonly used for imaging purposes. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a photodiode for the camera of Torii et al., to reduce production costs and simplify the design of the system by utilizing common parts.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsunekawa et al. US Patent No. 4,335,942.

Tsunekawa et al. teach (see Fig. 1) a method of focusing comprising generating a first image (in IM1) and a second image (in IB1) of the top surface of a workpiece (OB2), and providing an indication of distance between said first and second images and adjusting the vertical position between a photographic lens (LS) and the workpiece (see Col. 4, line 58 to Col. 5, line 26) so that the first and second images coincide (see Col. 2, lines 49-52). Tsunekawa et

al. do not teach projecting a first and second light beam to generate the first and second image- however, it is seen from Fig. 1 that a first (off OB2 onto IM1) and second (off OB2 onto IB1) light beam is used to reflect off the object to obtain a first and second image or moving the workpiece instead of moving the photographic lens. It is well known in the art to project light beams to obtain a clearer image for focusing, and it is design choice to move the workpiece as opposed to moving the photographic lens, as both are functionally equivalent methods of varying the distance between the workpiece and the photographic lens. It would have been obvious to one of ordinary skill in the art at the time the invention was made to project light beams off the workpiece and adjust the position of the workpiece in the method of Tsunekawa et al., to enhance the image-capturing process to obtain brighter image for improved focusing and improve cost efficiency by using conventional moving, workpiece-mounted table instead of more expensive and delicate lens motor mechanisms.

Allowable Subject Matter

6. Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: The method as claimed, specifically in combination with monitoring a boundary, generating signals of the position of the boundary, and determining a center point for said boundary, is not disclosed or made obvious by the prior art of record.

Response to Arguments

8. Applicant's arguments filed April 29, 2003 have been fully considered but they are not persuasive.

Regarding the Torri reference, Applicant argues that Torri does not teach a reference image but instead a reference value, and states that a reference value is not an image. Examiner asserts Torri teaches comparing every pixel value in the detected image with the reference value- therefore, Torri is essentially comparing the detected image with a reference image having identical dimensions as the detected image with pixels all containing the reference value. Since comparing objects having different dimensional characteristics is inconceivable, Torri essentially dimensionally extends the reference value to an entire reference image while comparing each detected pixel in the detected image with the associated pixel in the reference image and storing the comparison result in memory.

Applicant also argues that Torii does not teach a lateral shift of a light beam for distance but instead, the scanning beam of Torii is rotated by operation of the mirror. Examiner asserts that by rotation of the mirror in Torri, the angle of the light beam from the mirror towards the workpiece changes, and therefore, the light beam incident on the top surface of the workpiece is displaced or "laterally shifted" on the surface accordingly, by principle of triangulation. Then, the displacement of the beam spot is used to calculate the vertical distance, as explained by Torii (see Col. 7, lines 38-57).

Regarding the Tsunekawa reference, Applicant argues that Tsunekawa does not teach providing of an indication of distance. Examiner asserts that Tsunekawa teaches detection of three different focus states, forward-focus, in-focus, and rearward-focus (see Col. 2, line 68 to Col. 3, line 2) when comparing between a fundamental image and a reference image (see Col. 2, line 28-32) to measure distance to the object- a focus state is an "indication of distance" between two images and therefore, Tsunekawa teaches providing an "indication of distance" between two images. Applicant also argues that Tsunekawa does not teach a "workpiece". Examiner interprets "workpiece" as simply an object of interest, which Tsunekawa teaches (see Col. 2, lines 21-32). However, if Applicant is specifying a "workpiece" in terms of an object for manufacturing, inspection, etc., Examiner submits that it is well known in the art to use a camera for a microscope, to observe an object for examination and capture images for subsequent re-examination.

Conclusion

9. Examiner notes that Applicant amended Claim 12 in the prior Amendment in response to Examiner's objection to a lack of antecedent basis. Examiner appreciates Applicant's cooperation in correcting the objection but has realized that Claim 12 has actually been cancelled in a prior response; therefore, Claim 12 remains cancelled in spite of the Applicant's amendment.

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (703)306-3441. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (703)308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7724 for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

SY

SY
July 24, 2003

DAVID PORTA
SUPERVISORY PATENT EXAMINER
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